

Paul Tiede | Curriculum Vitae

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Education

University of Waterloo/Perimeter Institute

Waterloo, ON

Ph.D. Physics

Sept. 2017–Spring 2021 (Expected)

- o Thesis: The Nature and Impact of Active Galactic Nuclei
- o Supervisor: Avery Broderick

University of Waterloo

Waterloo, ON

M.Sc Applied Mathematics (Mathematical Physics)

Sept. 2015– Sept. 2017

- o Thesis: The Relation between Polygonal Gravity and 3D Loop Quantum Gravity
- o Supervisor: Florian Girelli

University of Waterloo

Waterloo, ON

B.S. Mathematical Physics, Specialization: Astrophysics, Dean's Honors List

2010–2015

- o Thesis I: Deformed Phase Space and Poisson Lie Groups
- o Thesis II: Limits on the Existence of Gamma-Ray Halos Around Fermi Active Galactic Nuclei

Awards & Honours

Ph.D. Awards.....

Breakthrough Prize in Fundamental Physics

Fundamental Physics Prize Foundation

2019

Alexander Graham Bell Scholarship (CGS-D)

National Science Engineering Research Council (NSERC)

2017–2020

Value: \$ 35,000 per year

President's Graduate Scholarship (Doctorate)

University of Waterloo

2017–2020

Value: \$ 10,000 per year

Master's Awards.....

Applied Mathematics Outstanding Teacher Assistant Award

University of Waterloo

2017

Canada Graduate Scholarship (CSGS-M)

NSERC

2015–2016

Value: \$ 17,500 per year

President's Graduate Scholarship (Masters)

University of Waterloo

2015–2016

Value: \$ 10,000 per year

Undergraduate Awards.....

Undergraduate Student Research Award

NSERC 2015

Helen Sawyer Hogg Scholarship

University of Waterloo 2014

Value: \$ 500

Undergraduate Student Research Award

NSERC 2013

Undergraduate Student Research Award

NSERC 2012

University of Waterloo

President's Scholarship 2010

Value: \$ 2,000

Teaching Experience

Graduate Teaching Assistant

University of Waterloo

- o Physics 364 (Mathematical Physics I) Fall 2020
- o Physics 115 (Physics for Engineering) Fall 2019
- o Math 138 Calculus II (Physics based Section) Winter 2017
- o Amath 473 Quantum Theory II Fall 2016
- o Math 227 Calculus II for Science Fall 2016
- o Amath 250 Introduction to Differential Equations Fall 2015

Presentations

Time Domain and Modeling of Sgr A*

Event Horizon Telescope Collaboration Meeting 2019, (Invited) 2019

Spacetime Tomography with the Event Horizon Telescope

Event Horizon Telescope Collaboration Meeting 2019, (Invited) 2019

Spacetime Tomography with the Event Horizon Telescope

Black Hole Initiative (BHI) Harvard University, (Invited) 2019

Bow Ties in the Sky: Exploring the Fermi Gamma ray universe

University of Waterloo Applied Mathematics Graduate Colloquium 2016

Modeling and Detecting Gamma Ray Halos from Active Galactic Nuclei

Canadian Undergraduate Physics Conference 2013

Programming Languages

Julia, C++, Python, Bash, CUDA, MPI

Publications

Referred Journal Articles.....

- [2] Avery E. Broderick, Roman Gold, Mansour Karami, Jorge A. Preciado-López, **Paul Tiede**, Hung-Yi Pu, Kazunori Akiyama, Antxon Alberdi, Walter Alef, et al. "THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope". *ApJ* 897.2, 139 (July 2020), p. 139.
- [1] Avery E. Broderick, Dominic W. Pesce, **Paul Tiede**, Hung-Yi Pu, and Roman Gold. "Hybrid Very Long Baseline Interferometry Imaging and Modeling with Themis". *The Astrophysical Journal* (July 2020).
- [3] **Paul Tiede**, Avery E. Broderick, Mohamad Shalaby, Christoph Pfrommer, Ewald Puchwein, Philip Chang, and Astrid Lamberts. "Constraints on the Intergalactic Magnetic Field from Bow Ties in the Gamma-Ray Sky". *The Astrophysical Journal* 892.2, 123 (Apr. 2020), p. 123.
- [4] **Paul Tiede**, Hung-Yi Pu, Avery E. Broderick, Roman Gold, Mansour Karami, and Jorge A. Preciado-López. "Spacetime Tomography Using the Event Horizon Telescope". *The Astrophysical Journal* 892.2, 132 (Apr. 2020), p. 132.
- [5] Avery E. Broderick, **Paul Tiede**, Philip Chang, Astrid Lamberts, Christoph Pfrommer, Ewald Puchwein, Mohamad Shalaby, and Maria Werhahn. "Missing Gamma-Ray Halos and the Need for New Physics in the Gamma-Ray Sky". *The Astrophysical Journal* 868.2, 87 (Dec. 2018), p. 87.
- [6] **Paul Tiede**, Avery E. Broderick, Mohamad Shalaby, Christoph Pfrommer, Ewald Puchwein, Philip Chang, and Astrid Lamberts. "Bow Ties in the Sky. II. Searching for Gamma-Ray Halos in the Fermi Sky Using Anisotropy". *The Astrophysical Journal* 850.2, 157 (Dec. 2017), p. 157.
- [7] Avery E. Broderick, **Paul Tiede**, Mohamad Shalaby, Christoph Pfrommer, Ewald Puchwein, Philip Chang, and Astrid Lamberts. "Bow Ties in the Sky. I: The Angular Structure of Inverse Compton Gamma-Ray Halos in the Fermi Sky". *The Astrophysical Journal* 832.2, 109 (Dec. 2016), p. 109.

EHT Collaboration Articles.....

- [1] Roman Gold, Avery E. Broderick, Ziri Younsi, Christian M. Fromm, Charles F. Gammie, Monika Mościbrodzka, Hung-Yi Pu, Thomas Bronzwaer, Jordy Davelaar, et al. "Verification of Radiative Transfer Schemes for the EHT". *ApJ* 897.2, 148 (July 2020), p. 148.
- [2] Jae-Young Kim, Thomas P. Krichbaum, Avery E. Broderick, Maciek Wielgus, Lindy Blackburn, José L. Gómez, Michael D. Johnson, Katherine L. Bouman, Andrew Chael, et al. "Event Horizon Telescope imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution". en. *A&A* 640 (Aug. 2020). Publisher: EDP Sciences, A69.
- [3] F. Roelofs, M. Janssen, I. Natarajan, R. Deane, J. Davelaar, H. Olivares, O. Porth, S. N. Paine, K. L. Bouman, et al. "SYMBA: An end-to-end VLBI synthetic data generation pipeline. Simulating Event Horizon Telescope observations of M 87". *AAP* 636, A5 (Apr. 2020), A5.
- [4] Maciek Wielgus, Kazunori Akiyama, Lindy Blackburn, Chi-kwan Chan, Jason Dexter, Sheperd S. Doeleman, Vincent L. Fish, Sara Issaoun, Michael D. Johnson, et al. "Monitoring the Morphology of M87* in 2009-2017 with the Event Horizon Telescope". *ApJ* 901.1, 67 (Sept. 2020), p. 67.

- [5] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L1.
- [6] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. II. Array and Instrumentation". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L2.
- [7] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. III. Data Processing and Calibration". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L3.
- [8] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. IV. Imaging the Central Supermassive Black Hole". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L4.
- [9] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. V. Physical Origin of the Asymmetric Ring". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L5.
- [10] The Event Horizon Telescope Collaboration, Kazunori Akiyama, Antxon Alberdi, Walter Alef, Keiichi Asada, Rebecca Azulay, Anne-Kathrin Baczko, David Ball, Mislav Baloković, et al. "First M87 Event Horizon Telescope Results. VI. The Shadow and Mass of the Central Black Hole". en. *ApJL* 875.1 (Apr. 2019). Publisher: IOP Publishing, p. L6.
- [11] Oliver Porth, Koushik Chatterjee, Ramesh Narayan, Charles F. Gammie, Yosuke Mizuno, Peter Anninos, John G. Baker, Matteo Bugli, Chi-kwan Chan, et al. "The Event Horizon General Relativistic Magnetohydrodynamic Code Comparison Project". *ApJs* 243.2, 26 (Aug. 2019), p. 26.

Outreach Articles.....

- [1] **Paul Tiede**. "Fermi Space Telescope and Creating Gamma-ray Images". *University of Waterloo Phys 13 News*. 144 (Oct. 2012), pp. 11–14.